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system, but he does not think that, even after it has received all its tributaries, the Kassai can be in any way compared with the Lualaba. Where he passed it the last time, in 8° S. lat. in the dry season, the Kassai had only a breadth of 394 feet, and a depth of ten feet, with a current of rather less than two miles.

Notes.—A relief map of the equatorial region of Africa on the horizontal scale of one inch to twenty-five miles, and the vertical scale of one inch to five thousand feet has recently been exhibited in London.——The French Government has undertaken to make a railroad between the Upper Senegal and the Niger rivers. The surveying expeditions reached the starting point of the road on the Senegal at Khay, seven or eight miles below Medina on November 6th last.——Commander V. L. Cameron, sailed from Liverpool on December 31, 1881, for Axim to join Capt. R. F. Burton in his exploration of the country at the back of the western portion of the Gold Coast colony.——A Russian expedition for the exploration of Western Equatorial Africa is to leave Europe in April. The Cameroons mountains are proposed as the base of operations, and the exploration of the reported lake region to the east of them is the chief aim of the expedition.——Dr. Josef Chavanne estimates the mean altitude of the continent of Africa to be 2169.93 feet or double the mean altitude of the continent of Europe, which is estimated at 971.41 feet.——Since the return of the three native envoys from England, King Mtesa has been much better disposed to the English missionaries in Uganda.

MICROSCOPY.[1]

AMERICAN SOCIETY OF MICROSCOPISTS.—The Proceedings of the fourth annual meeting of this Society, held at Columbus, Ohio, August 9th to 11th, 1881, have been issued in a pamphlet of 102 pages and seven plates. Perhaps the most generally interesting of the ten papers published, is "A Study of Blood," by Lester Curtis, M.D., of Chicago. This paper describes a very careful study, with one-tenth and one-sixteenth objectives, of fine definition and high resolving power, of pus corpuscles, and of white corpuscles, and bleached red corpuscles of human blood, with a view to determining the reality or otherwise, of the net work of fine fibers described as occurring in such structures, by Dr. Carl Heitzmann, of New York, in 1873, and subsequently by Dr. Louis Elsberg, of the same city, Dr. Klein, of London, in his Atlas of Histology, and other writers. Although Dr. Curtis easily recognized (what, indeed, it is not difficult to see) a more or less distinct appearance resembling a net-work, when the field was somewhat blurred and the outlines of objects indistinct, he uniformly by such change of adjustment as would secure a fine definition and distinct outlines, found the appearance of net-work replaced by a quite distinct view of the surface of the corpuscle covered with small nodules of unequal size and placed at irregular intervals, clearly defined, and capable of casting shadows in various directions. No net-work could be seen between or below these nodules, though in some cases their shadows might seem to resemble one. Aside from the opinion of so competent a judge of appearance as Dr. Curtis, it may be added that the appearance of nodules in the absence of a net-work, as figured in the drawings representing his observations, indicates clearness of definition and reality of structure as distinguished from optical illusion. The only real question is whether a net-work of fibers, on another plane underlying this could have escaped detection by the same means which rendered the nodules so distinct. While the author's experience may not be considered absolutely conclusive in so difficult a question, contested by so competent authority, still it is a valuable and interesting contribution to the subject, and it is quite sufficient to teach caution in adopting a theory which may yet be discarded along with the hexagonal markings of *Pleurosigma angulatum.*

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[1] This department is edited by Dr. R. H. WARD, Troy, N. Y.

An interesting paper by C. M. Vorce, of Cleveland, on "Forms observed in water of Lake Erie," discusses the various vegetable and animal organisms obtained by filtration, through a muslin bag tied over a faucet, from the water supply of the city of Cleveland. Besides casual observations made at other times, regular weekly examinations were made for a year or more. Nearly 200 forms are figured upon a folded plate. The following general conclusions are of special interest: "Surprising to the writer was the discovery that the winter season was the most prolific of the whole year in number and variety of forms observed. * * * The most noticeable peculiarity of the filterings taken at this season is the abundance of infusoria, rotatoria and crustacea, which in small bodies of water are warm-weather forms; and next in attracting attention is the remarkable activity of reproduction in vegetable life. Indeed, it is soon apparent to the observer that while the advent of wintry frosts almost suspends the course of growth and reproduction in most allied forms in small and shallow waters, in these vast watery worlds the course of life with these minute organisms goes unceasingly on without a rest, and with, indeed, no perceptible check or stay. When the change in volume is imperceptible, and the change in average temperature but a few degrees, there is for the forms in these great waters little or no need for nature to resort to 'winter eggs' and 'resting spores,' although they are sometimes found, more, probably, from organic idiosyncracy than from climatic or local causes, such as chiefly contribute to cause such life changes in usual circumstances. In the lake waters the advent of spring exhibits no other effect upon the organisms we are considering than to cause an acceleration of the processes of multiplication and reproduction in many of the forms, so that these accelerated forms eventually become so much more numerous than the others that the latter are frequently looked upon as missing, although usually to be found if carefully searched for. In addition to this cause, the same effect is increased as spring advances and summer approaches, by the shallow water forms being swept in from the streams and continuing their reproduction in the lake waters. And in the cases where examinations are made from water supplies passing through storage reservoirs, the influence of the still water in the reservoir, and of its bottom of sluicy mud, is also to be considered. As summer wanes and cold weather again approaches, the winter forms increase in activity and abundance, while summer forms become more inactive, and the preponderance is again reversed."

Under the caption of "A Tumor of the left auricle," D. N. Kinsman, M. D., of Columbus, gives an excellent clinical report of a rare and interesting medical case. Though chiefly valuable to physicians, the microscopical portion is sufficiently prominent to justify its appearance in the proceedings.

The nature of "muscular contractility" is treated at length by Jacob Redding, M. D., of Falmouth, Ind. The author's theory seems to rest partly upon plausible but not altogether safe reasoning as to what would be likely to be found; his description of the tissues studied is not likely to be fully accepted by histologists, who will approve still less his free statements as to the superficial view of former authors, and of their having completely ignored, or, at least, remained silent upon the subject of the interior of the muscular "cells." The article will repay a careful study. It is illustrated with a diagrammatic plate, which delineates with great distinctness the author's theory.

Shorter articles occur upon the "Innervation of the lungs," by A. M. Bleile, M. D.; "Gregarina in the American lobster," by Professor A. H. Tuttle, and "Destruction of Acari by a fungus," by C. M. Vorce. Also, a review of different kinds of "Binocular microscopes," by George E. Fell; an argument in favor of making "Homogeneous-immersion objectives adjustable," by George E. Blockhan, M. D., and a description, by E. L. Shurley, M. D., of "An improved slide for the examination of gaseous matter." This is a glass slide with an attached cell and cover-glass, the center of the bottom of the cell being raised by a glass disk, so that the bottom of the cell will be within reach of the focal capacity of the objective used. The gas is introduced through an opening in the side of the cell by means of a fine metallic canula and a small flexible rubber tube, supplied from a compressible rubber bag or globe, such for instance, as in the instruments used in medical practice for the insufflation of powders, or in the chemical laboratory for operating wash-bottles and other apparatus. The method is capable of further usefulness in microscopy.

Bausch's Homogeneous Immersion Objectives.—The Bausch & Lomb Optical Company, Rochester, which, under the able supervision of Mr. Edward Bausch, is making remarkable progress in the construction of lenses, has added to its list a series of homogeneous immersion objectives, from $\frac{1}{4}$th to $\frac{1}{25}$th inch, claiming an angular aperture of 140° in medium equivalent to crown glass. They are made adjustable, and up to $\frac{1}{12}$th inch cost from $70 to $100. By a change of adjustment they are capable of use as water or glycerine immersion. An immersion illuminator of ingenious construction is made for use with them. New $\frac{1}{4}$th, dry, of 140° is also made, with long working focus, and so well corrected that it will resolve No. 18 or No. 19 of Möller's test-plate in balsam.

Lehigh Valley Microscopical Society.—This new society held its February meeting in Easton, with a good attendance. Dr. Isaac Ott described and illustrated Dr. Stohrer's (of Leipsic) plan for registering the growth of plants, and confirmed that author's hypothesis that during the day plants do not grow as rapidly as at night. Mr. F. Wolle exhibited specimens of filamentous alga, illustrating a growth in some instances of from one-half to three-quarters of an inch per hour. Mr. E. A. Rau also exhibited botanical specimens illustrating the growth of the lower orders. Other objects were shown by E. P. Seip and Breinig, and Mr. G. W. Stout.

Pigeon-post Films.—Having obtained a supply of the gelatine films used for transmission of news by pigeon-post during the siege of Paris (the expedient of posting despatches in the form of microscopic photographs, by the way, having been suggested by Sir David Brewster nearly fifty years ago), the editor of this department of the Naturalist will take pleasure in sending an unmounted specimen, sufficient for a microscopic object, to any person sending him a stamped and directed envelope for that purpose. Return exchange optional.

Blood Stains on Steel.—Dr. M. C. White, of New Haven, has been able to recognize and measure, by means of the vertical illuminator and a eighth objective, blood-corpuscles upon a steel instrument that had been exposed during two winters in the woods.

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SCIENTIFIC NEWS.

— The annual report of the Boston Society of Natural History for 1881, while recording progress in the arrangement of the museum and the issue of its publications, shows the amount of general interest felt by the citizens at large in the popular work of the society in the diffusion of science. Two ladies have generously paid the entire expenses of the Teachers' School of Science estab-